Hytera DMR Conventional Series

Release Notes

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Revision History

Version	Date	Description	Remarks
R4.00.01	September 15, 2011	Initial release	
R4.00.02	October 20, 2011	Revise the RDAC release	
R4.01.01	November 23, 2011	Release R4.1	
R4.05.01	Apr 24, 2012	Release R4.5	
R5.00.01	November 28, 2012	Release R5.0	

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1. Product Versions

Hytera DMR Series Products	SW Release Version
Subscriber	A5.00.15.001 S5.00.15.001
Repeater	A5.00.10.005 S5.00.10.005
CPS	V5.00.09.006
RDAC	V5.00.06.000
Tuner	V5.00.04.001

2. What's New in Release

2.1 What's New in Subscriber Release R5.0?

2.1.1 New Enhancements

- All Call talkback in private mode

Allows user to make a Private Call to a receive All Call.

The CPS path to configure this feature is via DMR Services-> Basic -> All Call Talkback in Private Mode. When this is enabled, user can initiate the private call talkback via the missed call list in the menu.

- Call alert from contact list

Allows user to associate call alert to a member in the contact list. When this configuration is set, a PTT in contact list for this member list will initiate a call alert instead of a voice call.

The CPS path to configure this feature is via DMR Services -> Contacts -> Call Type -> Alert call.

- Caller ID display

This is a digital specific feature, where the caller identification (either in ID or alias) are automatically display during the call hang time of the receiving radio. This is only supported in radio model with display.

- GPS revert during a call

Allows user to configure GPS revert during a call session (include call receiving and call hang time). When this is not enabled, GPS revert only takes effective when the radio is idle.

The CPS path to configure this feature is via DMR Services -> Basic -> In Call GPS Revert.

- GPS trigger enhancement

Allows user to trigger GPS sending not only via fixed interval (interval is notify via radio dispatcher), but also from distance, time and also programmable button toggle. This is supported both in third party API and also via CPS.

The CPS path to configure this feature is via General Setting -> Accessories -> GPS Trigger.

- GPS text message sending via telemetry

Allows user to trigger GPS message sending via telemetry whenever there is a voltage changes in a predefined IO.

The CPS path to configure this is via General Setting -> Telemetry -> Telemetry VIO -> Send Status w/GPS Message.

- RRS and GPS sending in radio disable state

Allows radio to continue sending the RRS and GPS message when radio is disabled. In earlier firmware release, the RRS and GPS sending will be suspended when radio is disabled.

- Pre-defined GPS/RRS revert channel when in pseudo trunk mode

Allows user to configure a dedicated transmit channel for GPS/RRS sending when radio operates in pseudo trunk mode. This feature shall be configured base on the real topology at customer side when dispatcher is deployed.

The CPS path to configure this feature is via Channel -> Digital Channel -> Tx -> GPS Revert Channel/RRS Revert Channel.

- RRS revert

Allows user to perform RRS on a pre-defined revert channel. In earlier firmware release, the RRS sending can only be supported in current channel.

The CPS path to configure this feature is via Channel -> Digital Channel -> Tx -> RRS Revert Channel.

- Individual tone volume control

Allows user to configure the tone volume (in tone level) for many of the radio's tones.

The CPS path to configure this feature is via General Setting -> UI Indication.

- Inclusion of volume knob when keypad is locked

Allows user to include the volume knob to be locked when keypad locked is On.

The CPS path to configure this feature is via Common -> UI Setting -> Select Button Lock -> Volume Knob.

- ATEX radio speaker's amplitude control

Allows user to limit the amplitude's of the speaker data for security measure in an explosive environment.

The CPS path to configure this feature is via Common -> UI Setting -> Output Audio Limiter.

- Man down trigger enhancement

Allows user to trigger the man down from the 3 options of Tilt Only, No Movement Only, Tilt Or No Movement. The tilt angle are configurable with 30, 45 and 60 degree (the degree is measured from the horizontal land axis to the radio axis).

The CPS path to configure this feature is via Common -> Accessories -> Man Down -> Trig Tilt Gradient -> Man Down Trigger Method.

- Refinement to the internal/external mic VOX gain level

Allows user to configure the internal/external mic VOX gain level from an old level of 1-5 to new latest level of 1-9.

The CPS path to configure this feature is via Common -> Microphone/VOX -> VOX -> internal/external mic VOX gain level.

- Option Board enhancement

Icon of is used to indicate an option board is installed and initialized successfully with radio (In earlier firmware release, the icon only shown for encryption option board and now is it spread for all option board). Besides the icon enhancement, the option board and radio interaction management has been improved in this release version too.

The CPS path to configure option board enable/disable is via Channel -> Digital Channel -> Option Board.

- Option Board pass-through mode

Allows third party partners to send option board's firmware via PC USB to the option board installed in radio. For more information, please contact your nearest sales to get more information on the Application Third Party Partnership Programme.

- Priority scan alert On/Off

Allows radio user to turn On/Off the priority scan alert.

The CPS path to configure this feature is via General Setting -> UI Indication -> Tone Alerts -> Scan Priority Channel Tone.

- 5 tone features enhancement

Allows user to configure 5 tone features enhancement of emergency call, stun, unstun, silent interrogate and ACK1/Ringing.

The CPS path to configure this feature is via 5 Tone Services -> Decode Definition -> Decode Definition.

- Analog emergency enhancement with 5 tone telegram

Allows user to send a 5 tone telegram when an analog emergency is triggered. The telegram shall allow the receiving radio to be able to know the emergency initiator's call ID.

The CPS path to configure this feature is via Emergency -> Analog Emergency -> Emergency ID Type/Emergency Telegram.

- Battery life enhancement

Allows user to enjoy longer battery life with the optimization in this latest firmware release. Table below listed the battery life improvement that is carried out on a PD780 radio with battery capacity of 2000mAh, with the measurement method of transmit-receive-idle 5-5-90 duration.

Working Mode / **Battery Saver mode**	Analog/High Power （hr）	Analog/Low Power （hr）	Digital/High Power （hr）	Digital/Low Power （hr）
1:1	0.29 hr	0.45 hr	0.47 hr	0.61 hr
1:2	0.32 hr	0.51 hr	0.52 hr	0.69 hr

2.1.2 New Features

- Remote Monitor feature license control

Remote Monitor has been upgraded to a chargeable feature that need a feature license to operate. By default, it is given for free. Only restricted region that does not allow remote monitor to be used, it need to reapply to disabled it.

The CPS path to enable this feature is via Common -> Feature Control -> Remote Monitor. (For more information, please contact your nearest sales support to get more information.)

- Analog mode only feature license control

A new chargeable feature of pure Analog mode has been added to this latest release.

The CPS path to enable this feature is via Common -> Feature Control ->Conventional -> Analog Mode. (For more information, please contact your nearest sales support to get more information.)

- DMRA enhanced encryption

Allows user to enable the DMRA enhanced encryption, which is an encryption logic defined by DMR association, thus ensuring compatibity in encryption voice communication between different DMR manufacturers.

This feature is supported with ARC: 40 bits encryption key, AES: 128 bits, 256 bits encryption key.

The CPS path to configure this feature is via DMR Services -> Encrypt -> Encrypt key length, Channel -> Digital Channel -> Encrypt. (For more information, please contact your nearest sales to get more information as DMRA enhanced encryption is a chargeable feature with license control).

- Encryption Option Board API

Allows third party partner to develop digital encryption option board base on the latest encryption API addition. The API scope only covers for digital encryption.

The CPS path to configure this feature is via Channel -> Digital Channel -> Option Board. For more information, please contact your nearest sales to get more information on the Application Third Party Partnership Programme.

- Encryption key length control

Due to the various import/export regulation control in different country, the latest release of the firmware has been enhanced with encryption key length control before manufactured. This encryption key length control has been pre-set before radios are shipped from factory, and not modifiable right after radio shipped. The control is model number specific, which is the third bit in the features range, as highlighted as red below: PD780-00000000-MB0000-U1-0-F. The definition of the bit is as below:

1. When the bit is set to 0,the maximum length of the encryption key is 256 bits；
2. When the bit is set to 1, the maximum length of the encryption key is 40 bits；
3. When the bit is set to 2, the encryption is totally disabled.

Please note that this setting has to be non-zero value in order for chargeable feature of Basic and Enhanced Encryption license control to be applied.

- Loudness and quality optimizer (LQO)

Allows user to enhance the listening experience by automatic frequency response adjustment in noisy/quiet environment. LQO is Hytera's patent, which automatically optimize the audio high frequency response and volume level in noisy environment. This enhances user experience as user do not need to change the volume level frequently when in noisy and non-noisy environment.

The CPS path to configure this feature is via Common -> UI Setting -> LQO.

User can also On/Off this feature via the Radio Setting menu.

- Audio feedback suppressors

Allows user to enhance the listening experience when talk in near distance. This feature automatically adjusts the received signal's audio amplitude to improve the echo feedback when both party are talking near to each other. This is only supported in digital mode.

The CPS path to configure this feature is via Common -> Microphone/VOX -> Audio Feedback Suppressors.

- Speaker Equalizer

Allows user to enhance the listening experience in covert radio model by improving the audio response in low and high frequency audio range. This is a covert radio model specific feature for covert's speaker performance optimization.

The CPS path to configure this feature is via Common -> UI setting -> SPK Equalizer.

- Always Treble Boost

Allows user to enhance the listening experience by enhancing the audio high frequency response. Compared to LQO, it is not automatic and once enabled, the logic will be

activated in all receiving audio.

The CPS path to configure this feature is via Common -> UI Setting -> Microphone/VOX -> Always Treble Boost.

- Buffer Management

Allows third party developers to continually send few control messages to mobile radio for execution as the mobile has been enhanced with the message queue management. This shall enhance the PC processing efficiency as PC application no longer need wait till a control message is processed before the subsequent control can be sent. There is priority associated with each message to mobile. For more information, please contact your nearest sales to get more information on the Application Third Party Partnership Programme and the Application Development Kit for full documentations on the enhancement above.

- New version of SELP vocoder

A new SELP vocoder has been enhanced in this latest release. The latest SELP version has an enhanced audio quality. However, it is incompatible with R4.5 release. As such, it is recommended for users to upgrade the old radios to latest R5.0 if voice communication interoperable is needed.

- Priority scan

Allows radio to continue scan of the priority channels during call receiving. The interval of the priority scan during a call is configurable in CPS.

The CPS path to configure this feature is via Scan -> Scan List 1 -> Priority Channel 1/Priority Channel 2/Priority Sweep Time.

- Roaming follow full channel profile of master site

Allows the radio to fully follow the full channel parameters when a home site is selected during roaming. When this feature is disabled, instead of the full channel parameters, only 7 parameters in the full channel are selected, which is listed below:

1. Transmit frequency
2. Receive frequency
3. Color code
4. Slot
5. Talkaround setting
6. GPS Revert Channel
7. Emergency system（Include emergency revert channel）

The CPS path to configure this feature is via Roam -> Roam List 1 -> Follow All Master Site Config.

- Vox microphone's data select

Allows user to preset the microphone data source for VOX processing.

The CPS path to configure this feature is via Common -> Microphone/VOX -> VOX MIC Selection.

- Slot indication via GPIO

Allows user to preset an active level in GPIO to have slot 1/2 indication. This is a mobile only feature.

The CPS path to configure this feature is via General Setting -> Accessories -> Slot 1/2 indication.

- Front panel radio programming

Allows user to modify the radio's frequency, slot and color code from the radio menu.

The CPS path to enable the menu display is via General Setting -> Menu -> Programming.

- Preset channel programmable button

Allows user to move to a preset channel from a programmable button press.

The CPS path to configure this feature is via:

(1) General Setting -> Buttons -> Preset Channel 1-4,

(2) General Setting -> Setting -> Preset Channel to set the Zone/Channel.

- One Touch on keypad

Allows user to trigger one touch call on keypad 0-9, * and #. This is only supported when radio is in home screen (it is automatically disabled when radio in menu or dialing screen).

The CPS path to configure this feature is via:

(1) General Setting -> Buttons -> Default Numeric Key Selection -> One Touch Call,

(2) General Setting -> One Touch Call -> Numeric keypad.

- Channel change voice notification customization

Allows user to customize its own channel change voice notification. There is some guideline as listed below:

1. Only audio clips with wav file format is supported, and the total file size shall not exceed 512KB.
2. A PC tools is needed for the conversion of the wav file to the radio's loadable image. Please refer to the Voice Conversion Tool User Guide for more details.

The CPS path to configure this feature is via General Setting -> UI Indication -> Channel Notify. (For more information, please contact your nearest sales to get more

information on the audio conversion from the user guide.)

- Covert mode

Allows the radio to totally turn off all visual and audio indication once this feature is activated. Accessory audio and USB communication with radio remains active during this mode.

The CPS path to configure this feature is via:

(1) Common -> UI Setting -> Covert Mode;

(2) General Setting -> Buttons -> Covert mode.

For a displayed radio, this feature can also be triggered from the radio menu. The menu can be turned On via General Setting -> Menu -> Covert Mode.

- All Call Priority Interrupt

Allows a all call initiator to preempt an existing call to make way for the all call. The call preemption can be made to any active voice call. This feature shall only be supported in a pseudo trunk channel.

The CPS path to configure this feature is via:

(1) Channel -> Digital Channel -> Slot Operation -> Pseudo Trunk;

(2) Channel -> Digital Channel -> Priority Interrupt Encode/Decode;

(3) DMR Services -> Basic -> All Call Priority Interrupt.

- Radio disable priority interrupt

Allows a radio disable initiator to preempt an existing call to make way for the all call. The call preemption can be made to any active voice call. This feature shall only be supported in a pseudo trunk channel.

The CPS path to configure this feature is via:

(1) Channel -> Digital Channel -> Slot Operation -> Pseudo Trunk;

(2) Channel -> Digital Channel -> Priority Interrupt Encode/Decode;

(3) DMR Services -> Basic -> Radio Disable Priority Interrupt.

- Bluetooth

Allows user to user Bluetooth for communication in covert radio. Among the supported accessories are Bluetooth PTT and Bluetooth headset.

The CPS path to configure this feature is via:

(1) General Setting -> Menu -> Accessories -> BT;

(2) General Setting -> Buttons -> BT.

- Rental

Allows a radio to be rented out to some parties. There are 2 ways of calculating the total time to be rented, which is either via GPS absolute timing in a GPS radio, or from the total used time in a non-GPS radio.

The CPS path to configure this feature is via Common -> Rent.

When the renting times up, an audio and visual alert will be displayed to disable further radio usage.

- Over the air radio config

Allows over the air command sending to configure some radio's parameters, which include add/delete contact's list member, add group call to contact's list, modify transmit/receive frequency, modify color mode, modify radio ID, modify radio alias, and add members to received talkgroup list. For more information, please contact your nearest sales to get more information from the application note.

The CPS path to configure this feature is via DMR Services -> Basic -> Over The Air Decode.

Please note the commands sending is only supported from the third party PC application.

- Work order management

Allows third party to start some integration with the beta version of work order management. This is only meant for early integration for third party and it has not reached a final version. This is to be further optimized and finalized in R5.5 release.

- Persian Menu

Allows user to be able to select Persian in its menu display. User need to ensure Persian language pack is loaded into the radio for this to take effective. (For more information, please contact your nearest sales to get more information on the various region language pack.)

- T9 Text Input

Allows user to configure up to 6 new T9 text input of traditional Chinese, German, France, Spanish, Russia and Persian language. User can customize the text input as according to the language pack in it's region. (For more information, please contact your nearest sales to get more information on the various region language pack.)

2.2 What's New in Repeater Release R5.0?

2.2.1 New Enhancements

- Multi-Tone decode in mixed mode

Allows repeater to scan multiple CTC/CDC even when operate in mixed mode.

The CPS path to configure this feature is via Conventional -> Channel -> Mixed Channel -> Multi CDC/CTC.

- Talkback enhancement in repeater access management

Allows user to talkback to any call it is active with, without restricted to the multisite access management list. This shall enhance user experience to allow anyone to talkback in IP Multi-site network for the received call.

- Beacon network Tx Mode

Allows user to set the Slave repeater's beacon Tx mode to network, The beacon transmission duration and interval will be obtained from the master of the IP multi-site system, and be the same with the master. If set the master repeater's beacon Tx mode to network, the Beacon Tx Mode will be adjusted to Local.

The CPS path to configure this feature is via Conventional -> DMR Services -> Basic -> Beacon Tx Mode.

2.2.2 New Features

- Repeater API

Allows third party developers to develop PC applications base on the repeater API. The differences between repeater and mobile API is as below: (For more information, please contact your nearest sales to get more information on the Application Third Party Partnership Programme.)

1. Base on IP based connection, allowing PC to place in different geographical location;
2. Dual slot operation, allowing developers to operate in both slot for network control;
3. Monitoring capability, allowing developers to perform voice recording on the whole network;
4. Real time voice communication, allowing real time voice conversion from radio network to IP network.

- Multiple key encryption

Allows repeater to decode voice base on encryption key list. With a repeater network where subscriber is using multiple encryption key in its grouping, this feature shall allow better voice penetration.

The CPS path to configure this feature is via Conventional -> Channel -> Digital Channel -> Slot1 multi-key Decrypt/ Slot2 multi-key Decrypt.

- Front panel programmable buttons support

Allows user to configure some features to the repeater's front programmable buttons. Among the supported features are:

Supported feature list	Supported feature list
Tx enable/disable	Slot1 encrypt on/off
Minor alarm on/off	Slot2 encrypt on/off
Adjust power level	Slot1 audio output on/off
Adjust squelch level	Slot1 audio output on/off
Multi CTC/CDC on/off	Pre-emphasis on/off
Reset	Repeater/ base station mode
Monitor on/off	Repeater knockdown
Keypad lock/unlock	Analog speaker on/off
Scramble on/off	Major alarm on/off

- Buffer management

Please refer to subscriber section for more information on this feature. Both repeater and mobile adheres to the same design logic.

- DMRA encryption

Please refer to subscriber section for more information on this feature.

2.3 What's New in Tools Release R5.0?

2.3.1 New Enhancements

- RDAC enhancement with diagnostic and control

RDAC has been enhanced with few capabilities as below:

1. Enhance RDAC layout topology for better clarity of a network grouping. This shall allow the network administrator's a better control of network management.
2. Enhance RDAC with battery management for RD960 (backpack repeater).
3. Enhance with more configuration via network, which include contact list, transmit contact name, beacon signal configuration etc. This shall allow the network administrator's a better control of the whole network.

(Please contact your nearest sales support to get a copy of Hytera's IP Multi-site Connect Application note, RDAC user guide or RDAC help file for more details!)

2.3.2 New Features

- Contact list sorting via CPS

Allows user to enable/disable the contact list sorting. When enabled, contact list will be alphanumeric sorted. When disabled, the contact list will be sorted according to the order it is entered in CPS sequentially. The CPS path to configure this feature is via Option -> Preferences -> DMR Contact List Sort.

- Bluetooth pairing via CPS

Allows user to perform Bluetooth accessory pairing with radio via CPS

- Encryption KeyLoader

Allows user to perform encryption key management with higher security. This tool need to be used together with a USB hardware dongle, which is also one of the important authentication. (For more information, please contact your nearest sales to get more information on this new security tool and respective user guide.)

3. Important Notes for this Release

3.1 Subscriber

3.1.1 Software

(1) A new SELP vocoder has been enhanced in this latest release. The latest SELP version has an enhanced audio quality. However, it is incompatible with R4.5 release. As such, it is recommended for users to upgrade the old radios to latest R5.0 if voice communication interoperable is needed.

(2) A new enhance logic has been enhanced to the Hytera enhanced encryption (for 128 and 256 bits key length) for better security control. This cause incompatibility for R5.0 and R4.5 release for enhanced encryption of above key length. As such, it is recommended for users to upgrade the old radios to latest R5.0 if voice communication interoperable is needed.

(3) With the new features of DMRA enhanced encryption in R5.0, this ensure voice/data compatibility with other manufacturer who are also compliance to this standard as defined by DMR association.

(4) A new PC USB driver has been released together with R5.0. Some of the USB user guideline as below:

1. For users who has been using Digital USB version V2.0, it is recommended for them to remain untouch to the old USB drivers for all radio programming.
2. For third party PC partners who has been using Digital USB version V3.0, it is recommended for them to remain untouch for a 32 bits PC OS platform, and upgrade to latest Digital USB version V5.0 for a 64 bits PC OS platform.
3. For users who are new and using 64 bits PC OS platform, it is recommended to install directly with the latest Digital USB version V5.0.

3.1.2 Hardware

1. PD700 Business is available soon for sales!
2. The covert radio model with display X1p is available soon for sales!
3. Support the digital encryption option board, and release the common option board.
4. The radio which support Glonass GPS is available soon for sales!

   This is a new radio model with the Russia's Glonass GPS module. Please note that this is only hardware specific changes as all the rest of GPS application in radio remain the same as the Sirf GPS module.

5. The U5 MD780 is available soon for sales!

(For more information, please contact your nearest sales support to get more information.)

3.2 Repeater

3.2.1 Software

N/A

3.2.2 Hardware

V/U1 portable repeater RD960 is available soon for sales! (For more information, please contact your nearest sales.)

3.3 Tools

3.3.1 Software

Please note: The CPS and tuner support 64 bit OS are released in this version.

3.4 Accessories

1. The Bluetooth accessories support covert radio is available soon for sales!
2. The Bluetooth earpiece EAN19 (only support covert radio) is available soon for sales!

Wired earpiece (model name of EAN19)

Allows a covert radio user to to have an optional accessory of wired earpiece. This wired earpiece have 3 programmable buttons that can have the associated features configure from the radio CPS. For more information, please contact your nearest sales to get more information on the accessory. The CPS path to configure this feature is via General Setting -> Buttons -> Accessory P1-P3 Short/Long.

(For more information, please contact your nearest sales support to get more information.)

4. Issues

4.1 Issues Overview

This sections details critical issues in R4.5 that has been fixed in R5.0 software release. (Critical issues are issues that once arise, might incur serious impact to the user.)

4.2 Resolved Critical Issues from Previous Release

No.	Product	Description
#13043	Subscriber	When the scan initiated channel's transmit contact name has been set to none, and scan talkback is disabled, radio will transmit with wrong transmit contact name if PTT is pressed.
#10883	Subscriber	During roaming, if emergency is exited, followed by roaming exit, the emergency system will be faulty. Instead of using the master site associated emergency system, now the radio has used the emergency system for the roam initiated channel. (Please note that "Return to selected channel" is disabled in CPS for this case)
#11012	Subscriber	If Triggered Location Reporting Request has been received before radio entering emergency, followed by Emergency Location Report Stop Request during emergency state, radio will stop sending location report after emergency has exited (as the Emergency Location Report Stop Request command has reset the whole radio location report activity).
#11054	Subscriber	In direct mode, If one slot is occupied, Telemetry cannot work under pseudo trunk.
#14318	Subscriber	If the external speaker has been connected via the back mobile port, followed by smart accessory from the front panel port, the smart accessory detection will become invalid and need to recover by reattachment of the smart accessory.
#11909	Repeater	If CWID mixed mode timer is enabled, CWID transmission will be terminated abruptly when the voice repeating ends. The remaining CWID samples will only be transmitted in next CWID transmission.
#11921	Repeater	When flat audio is enabled, the audio from the repeater back port will not be streamed out.
#12424	Repeater	The CWID transmit interval will become inaccurate when it is set bigger than 600 s.
#12425	Repeater	In a busy IP network, due to data lost, instead of repeating with silent samples, sometimes it is repeating with old audio samples.
#11708	Repeater	When repeater IP Multi-site Connect is set to slot 1 only, slot 2 can

		also broadcast the activity from the IP line that is received from other repeaters over the network.
#11908	Repeater	The beacon transmission, which is supposed to be operated in local repeater, has been streamed out via IP network to others repeaters, causing un-necessary beacon transmission at other repeaters too.
#11918	Repeater	When master is dropped from the IP line and reconnected back, all the slaves re-registration when the master first comes back online will sometimes cause the master to reset if the slaves amount is huge.
#11968	Repeater	The physical IP network card can not communications with external, it will cause the repeater can not send out data.
#11309	Repeater	When the local access management ID beyond 65536, The Radio which radio ID is in the range of allowed radios can not access the repeater.

As SW releases of Repeater R4.6 is only released to limited users only, so it is mentioned here as the same scope has been automatically integrated to R5.0 too. This applied for TD #11968 and #12603.